QUALITY ASSURANCE PROJECT PLAN
29 Riverside Avenue Site (Enforcement Sampling Support)
Newark, New Jersey

Amendment 2

Prepared for:
United States Environmental Protection Agency/Environmental Response Team
Edison, New Jersey

By:
Lockheed Martin/Scientific, Engineering, Response and Analytical Services (SERAS)
Work Assignment Number: SERAS-089

Based on the Intergovernmental Data Quality Task Force Uniform
Federal Policy for Quality Assurance Project Plans
(Final Version 1.1, June 2006)

May 20, 2013

Formatted: Highlight

Formatted: Highlight

TABLE OF CONTENTS

Comment [DK1]: Update TOC when done

Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #1
Title and Approval Page

Site Name/Project Name: 29 Riverside Avenue Site (Enforcement Sampling Support)
Site Location: Newark, New Jersey

Document Title: Quality Assurance Project Plan for 29 Riverside Avenue Site (Enforcement Sampling)

Lead Organization: Environmental Protection Agency/Environmental Response Team (EPA/ERT)

Preparer's Name and Organizational Affiliation: Donna Getty, Lockheed Martin/Scientific, Engineering, Response and Analytical Services (SERAS)

Preparer's Address, Telephone Number, and E-mail Address: 2890 Woodbridge Avenue, Edison, New Jersey 08837, (732) 321-4274, donna.j.getty@lmco.com

Preparation Date (Day/Month/Year): May 20, 2013

Investigative Organization's Project Manager/Date: _____
Signature
Printed Name/Organization: Gary Newhart/ERT Work Assignment Manager

Investigative Organization's Project QA Officer/Date: _____
Signature
Printed Name/Organization: Stephen Blaze/ERT Quality Coordinator

Lead Organization's Project Manager/Date: _____
Signature
Printed Name/Organization: Donna Getty SERAS Task Leader

Approval Signatures/Date: _____
Signature
Printed Name/Title: Deborah Killeen/SERAS QA/QC Officer

Approval Authority:

Other Approval Signatures/Date: _____
Signature
Printed Name/Title: Dennis A. Miller/SERAS Program Manager

Document Control Numbering System: SERAS-089-DQAPPA2-052013

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #2
QAPP Identifying Information

Site Name/Project Name: 29 Riverside Avenue Site (Enforcement Sampling Support)
Site Location: Newark, New Jersey (NJ)
Site Number/Code: 02PC
Operable Unit:
Contractor Name: Lockheed Martin
Contractor Number: EP-W-09-031

Contract Title: SERAS
Work Assignment Number: SERAS-089

1. Identify regulatory program: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)
2. Identify approval entity: EPA/ERT for Region 2
3. The QAPP is (select one): ☐Generic ☒Project Specific
4. List dates of scoping sessions that were held: NA
5. List dates and titles of QAPP documents written for previous site work, if applicable:

Title	Approval Date
Quality Assurance Project Plan (QAPP) for Riverside Avenue Site, Newark, New Jersey, Scientific, Engineering, Response and Analytical Services (SERAS), document # SERAS-089-DQAPP-062310	06/23/10
QAPP for Riverside Avenue Site (Phase 2 Assessment), Newark, New Jersey, SERAS, document # SERAS-089-DQAPPA1-022311	02/23/11

6. List organizational partners (stakeholders) and connection with lead organization:
   EPA Region 2
7. List data users:
   EPA Region 2
8. If any required QAPP elements and required information are not applicable to the project, then circle the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusions below:

   WS #37 – Usability of the data will be determined by EPA Region 2

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #2
QAPP Identifying Information
(Continued)

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Related Documents
Project Management and Objectives		
2.1 Title and Approval Page	- Title and Approval Page	1
2.2 Document Format and Table of Contents 2.2.1 Document Control Format 2.2.2 Document Control Numbering System 2.2.3 Table of Contents 2.2.4 QAPP Identifying Information	- Table of Contents - QAPP Identifying Information	2
2.3 Distribution List and Project Personnel Sign-Off Sheet 2.3.1 Distribution List 2.3.2 Project Personnel Sign-Off Sheet	- Distribution List - Project Personnel Sign-Off Sheet	3 4
2.4 Project Organization 2.4.1 Project Organizational Chart 2.4.2 Communication Pathways 2.4.3 Personnel Responsibilities and Qualifications 2.4.4 Special Training Requirements and Certification	- Project Organizational Chart - Communication Pathways - Personnel Responsibilities and Qualifications Table - Special Personnel Training Requirements Table	5 6 7 8
2.5 Project Planning/Problem Definition 2.5.1 Project Planning (Scoping) 2.5.2 Problem Definition, Site History, and Background	- Project Planning Session Documentation (including Data Needs tables) - Project Scoping Session Participants Sheet - Problem Definition, Site History, and Background - Site Maps (historical and present)	9 10
2.6 Project Quality Objectives and Measurement Performance Criteria 2.6.1 Development of Project Quality Objectives Using the Systematic Planning Process 2.6.2 Measurement Performance Criteria	- Site-Specific PQOs - Measurement Performance Criteria Table	11 12

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #2
QAPP Identifying Information
(Continued)

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Related Documents
2.7 Secondary Data Evaluation	- Sources of Secondary Data and Information - Secondary Data Criteria and Limitations Table	13
2.8 Project Overview and Schedule 2.8.1 Project Overview 2.8.2 Project Schedule	- Summary of Project Tasks - Reference Limits and Evaluation Table - Project Schedule/Timeline Table	14 15 16
Measurement/Data Acquisition		
3.1 Sampling Tasks 3.1.1 Sampling Process Design and Rationale 3.1.2 Sampling Procedures and Requirements 3.1.2.1 Sampling Collection Procedures 3.1.2.2 Sample Containers, Volume, and Preservation 3.1.2.3 Equipment/Sample Containers Cleaning and Decontamination Procedures 3.1.2.3 Field Equipment Calibration, Maintenance, Testing, and Inspection Procedures 3.1.2.4 Supply Inspection and Acceptance Procedures 3.1.2.6 Field Documentation Procedures	- Sampling Design and Rationale - Sample Location Map - Sampling Locations and Methods/SOP Requirements Table - Analytical Methods/SOP Requirements Table - Field Quality Control Sample Summary Table - Sampling SOPs - Project Sampling SOP References Table - Field Equipment Calibration, Maintenance, Testing, and Inspection Table	17 18 19 20 21 22
3.2 Analytical Tasks 3.2.1 Analytical SOPs 3.2.2 Analytical Instrument Calibration Procedures 3.2.3 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Procedures 3.2.4 Analytical Supply Inspection and Acceptance Procedures	- Analytical SOPs - Analytical SOP References Table - Analytical Instrument Calibration Table - Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table	23 24 25

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #2
QAPP Identifying Information
(Continued)

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Required Documents
3.3 Sample Collection Documentation, Handling, Tracking, and Custody Procedures 3.3.1 Sample Collection Documentation 3.3.2 Sample Handling and Tracking System 3.3.3 Sample Custody	- Sample Collection Documentation Handling, Tracking, and Custody SOPs - Sample Container Identification - Sample Handling Flow Diagram - Example Chain-of-Custody Form and Seal	26 27
3.4 Quality Control Samples 3.4.1 Sampling Quality Control Samples 3.4.2 Analytical Quality Control Samples	- QC Samples Table - Screening/Confirmatory Analysis Decision Tree	28
3.5 Data Management Tasks 3.5.1 Project Documentation and Records 3.5.2 Data Package Deliverables 3.5.3 Data Reporting Formats 3.5.4 Data Handling and Management 3.5.5 Data Tracking and Control	- Project Documents and Records Table - Analytical Services Table - Data Management SOPs	29 30
Assessment/Oversight		
4.1 Assessments and Response Actions 4.1.1 Planned Assessments 4.1.2 Assessment Findings and Corrective Action Responses	- Assessments and Response Actions - Planned Project Assessments Table - Audit Checklists - Assessment Findings and Corrective Action Responses Table	 31 32
4.2 QA Management Reports	- QA Management Reports Table	33
4.3 Final Project Report		

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #2
QAPP Identifying Information
(Continued)

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Related Documents
Data Review		
5.1 Overview		
5.2 Data Review Steps 5.2.1 Step I: Verification 5.2.2 Step II: Validation 5.2.2.1 Step IIa Validation Activities 5.2.2.2 Step IIb Validation Activities 5.2.3 Step III: Usability Assessment 5.2.3.1 Data Limitations and Actions from Usability Assessment 5.2.3.2 Activities	- Verification (Step I) Process Table - Validation (Steps IIa and IIb) Process Table - Validation (Steps IIa and IIb) Summary Table - Usability Assessment	34 35 36 NA
5.3 Streamlining Data Review 5.3.1 Data Review Steps To Be Streamlined 5.3.2 Criteria for Streamlining Data Review 5.3.3 Amounts and Types of Data Appropriate for Streamlining		

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #3
Distribution List

QAPP Recipients	Title	Organization	Telephone Number	Fax Number	E-mail Address	Document Control Number
Donna Getty	Statistician/Task Leader (TL)	SERAS	(732) 321-4274	(732) 494-4021	donna.j.getty@lmco.com	SERAS-089-DQAPPA2-052013
Deborah Killeen	Quality Assurance/Quality Control (QA/QC) Officer	SERAS	(732) 321-4245	(732) 494-4021	deborah.a.killeen@lmco.com	SERAS-089-DQAPPA2-052013
Dennis A. Miller	Program Manager	SERAS	(732) 321-4216	(732) 494-4021	dennis.a.miller@lmco.com	SERAS-089-DQAPPA2-052013
Richard Leuser	Deputy Program Manager	SERAS	(732) 494-4060	(732) 494-4021	richard.m.leuser@lmco.com	SERAS-089-DQAPPA2-052013
Gary Newhart	Work Assignment Manager (WAM)	EPA/ERT	(513) 569-7661	(702) 784-8001	newhart.gary@epa.gov	SERAS-089-DQAPPA2-052013
Stephen Blaze	Quality Coordinator	EPA/ERT	(732) 906-6921	(732) 321-6724	blaze.stephen@epa.gov	SERAS-089-DQAPPA2-052013
Eric Daly	On-Scene Coordinator (OSC)	EPA Region 2	(732) 321-4350	(732) 321-4425	daly.eric@epa.gov	SERAS-089-DQAPPA2-052013
Eric Wilson	Chief, Removal Assessment & Enforcement Section	EPA Region 2	(732)321--6620		wilson.ericj@epa.gov	SERAS-089-DQAPPA2-052013
Jon Gabry	Chief, Hazardous Waste Support Branch	EPA Region 2	(732) 321-6650	(732) 906-6824	gabry.jon @epa.gov	SERAS-089-DQAPPA2-052013

Formatted: Left, Indent: Left: 0", First line: 0", Tab stops: Not at 0.5" + 1"

Formatted: Highlight

Formatted: Highlight

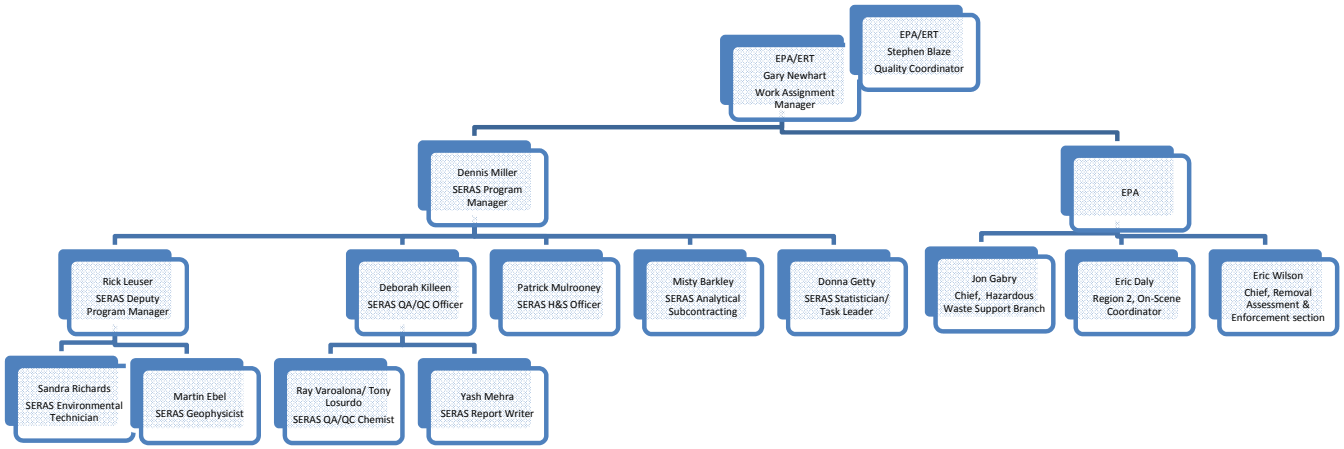
QAPP Worksheet #4
Project Personnel Sign-Off Sheet

Organization: SERAS/EPA/ERT

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read
Donna Getty	SERAS Statistician/Task Leader (TL)	(732) 321-4274		
Sandra Richards	SERAS Environmental Technician	(732) 321-4265		
Martin Ebel	SERAS Geophysicist	(732) 321-4241		
Gary Newhart	ERT WAM	(513) 569-7533		
Eric Daly	EPA R2 OSC	(732) 321-4350		
Jon Gabry	EPA R2 Hazardous Waste Support Branch Chief	(732) 321-6650		

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #5
Project Organizational Chart



Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #6
Communication Pathways

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure (Timing, Pathways, etc.)
Approval of initial QAPP and any amendments	ERT WAM ERT Quality Coordinator SERAS Program Manager SERAS QA/QC Officer SERAS TL	Gary Newhart Stephen Blaze Dennis A. Miller Deborah Killeen Donna Getty	(513) 569-7661 (732) 906-6921 (732) 321-4216 (732) 321-4245 (732) 321-4274	SERAS internal peer review, followed by ERT approval, implementation of changes is effective only with approved QAPP or QAPP Change Form.
Nonconformance and Corrective Action	SERAS Environmental Technician SERAS Geophysicist ERT WAM SERAS QA/QC Officer	Sandra Richards Martin Ebel Gary Newhart Deborah Killeen	(732) 321-4265 (732) 321-4241 (513) 569-7661 (732) 321-4245	Use of the Work Assignment Field Change Form for field issues.
Posting of Deliverables to the ERT-Information Management System (IMS) website	SERAS TL SERAS QA/QC Officer SERAS Deputy Program Manager SERAS Administrative Support	Donna Getty Deborah Killeen Richard Leuser Eileen Ciambotti	(732) 321-4274 (732) 321-4245 (732) 494-4060 (732) 321-4255	Per the work assignment, posting of deliverables to the ERT- IMS website constitutes delivery to the WAM.
Work Assignment	SERAS Program Manager	Dennis A. Miller	(732) 321-4216	Describes scope of work to SERAS personnel from the ERT WAM.
Health and Safety On-Site Meeting				Describe potential site hazards, required personal protective equipment, and access to local emergency services.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #7
Personnel Responsibilities and Qualification Table

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications
Donna Getty	Statistician	SERAS	TL/Project Supervision, Reporting, Document preparation	Minimum B.S. degree plus 8 years of related experience//Lockheed Martin Employee Files
Gary Newhart	WAM	ERT	Technical Direction	EPA job-related qualifications/EPA Files
Stephen Blaze	Quality Coordinator	ERT	QA Oversight	EPA job-related qualifications/EPA Files
Deborah Killeen	QA/QC Officer	SERAS	QA Oversight/Deliverable Review	Minimum B.S. degree plus 14 years of related experience/Lockheed Martin Employee Files
Ray Varsalona/ Tony Losurdo	QA/QC Chemist	SERAS	Validation of Cr(VI) analytical results	Minimum B.S. degree plus 8 years of related experience//Lockheed Martin Employee Files
Yash Mehra	Report Writer	SERAS	Analytical report writing and creation of .csv file	Minimum B.S. degree plus 8 years of related experience//Lockheed Martin Employee Files
Misty Barkley	Property Coordinator	SERAS	Laboratory subcontracting	Minimum B.S. degree plus 8 years of related experience//Lockheed Martin Employee Files
Sandra Richards	Environmental Scientist	SERAS	Sampling Support, photo-documentation	B.S. Chemistry, M.S. Environmental Management and 3 years environmental experience/Lockheed Martin Employee Files
Martin Ebel	Geophysicist	SERAS	Logging Cores	Minimum B.S. degree plus 14 years of related experience/Lockheed Martin Employee Files

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #8
Special Personnel Training Requirements Table

Project Function	Specialized Training – Title or Description of Course	Training Provider	Training Date	Personnel/Groups Receiving Training	Personnel Titles/ Organizational Affiliation	Location of Training Records/Certificates
QA Oversight	Uniform Federal Policy for Quality Assurance Project Plans	Advanced Systems	January 2006	Deborah Killeen	QA/QC Officer/SERAS	Quality Files
Sampling Operations	Health and Safety 8-hour Refresher	SERAS	April 2013	Sandra Richards	Environmental Technician/SERAS	Health & Safety Files
Logging Cores	Health and Safety 8-hour Refresher	SERAS	October 2012	Martin Ebel	Geophysicist/SERAS	Health & Safety Files
QA/Oversight Validation	Data Review and Validation	Laboratory Data Contracts	January 2007	Deborah Killeen	QA/QC Officer/SERAS	Quality Files
Validation Support	Data Integrity/Peak Integration Training	SERAS	August 2012	Raymond Varsolona Tony LoSurdo	QA/QC Chemist QA/QC Chemist	Quality Files

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #9
Project Scoping Session Participants Sheet

Project Name: Riverside Avenue – Enforcement Sampling Support **Projected Date(s) of Sampling:** 5/20/13 – 5/22/13 **Project Manager:** Donna Getty	Site Name: Riverside Avenue Site Location: 29 Riverside Avenue, Newark, NJ
Date of Session: 5/6/13 **Scoping Session Purpose:** Scoping meeting/conference call to discuss scope of SERAS involvement in the enforcement sampling effort, field tasks, planning issues etc.	

Name	Title	Affiliation	Phone #	E-mail Address	Project Role
Gary Newhart	Work Assignment Manager	ERT		newhart.gary@epa.gov	Technical Direction
Donna Getty	Statistician	SERAS	(732) 321-4274	donna.j.getty@lmco.com	Task Leader
Eric Daly	OSC	EPA Region 2	(732) 321-4350	daly.eric@epa.gov	Technical Direction
Martin Ebel	Geophysicist	SERAS	(732) 321-4241	martin.t.ebel@lmco.com	Technical Support
Jon Gabry	Chief, Hazardous Waste Support Branch	EPA Region 2	(732) 321-6650	gabry.jon@epa.gov	Technical Direction
Deborah Killeen	QA/QC Officer	SERAS	(732) 321-4245	deborah.a.killeen@lmco.com	Quality Assurance
Rick Leuser	Deputy Program Manager	SERAS	(732) 321-4060	richard.m.leuser@lmco.com	Project Oversight /Technical Advisor
Eric Wilson	Chief, Removal Assessment & Enforcement Section	EPA	(732) 321-6620	wilson.ericj@epa.gov	Technical Support
Elizabeth Butler	Remedial Project Manager	Region 2 EPA	(212) 637-4396	butler.elizabeth@epa.gov	Technical Support
William Reilly	Attorney	EPA	(212) 637-3154	reilly.williamj@epa.gov	Technical Support

Comments/Decisions: Conference call was held to establish the role SERAS will play in the Riverside Avenue enforcement sampling effort scheduled to begin May 20, 2013. SERAS will be responsible for the following activities: QAPP development, laboratory subcontracting, on-site sample management [supply glassware, collect samples from cores, COC, create and maintain a Scribe file, provide photo-documentation], validating the Hex Cr analytical results, producing an Analytical Report. The ERRS subcontractor will develop the HASP, and provide all equipment, materials and labor for the advancement of at least 6 soil borings (in the basement area of Building #7) to be completed to refusal or up to 15 feet in depth. Site activities are expected to last 2-3 days. Approximately 3 samples will be collected from each core. Samples to be collected will be determined by the EPA personnel on-site and based on visual inspection. Bore hole locations will be based on access logistics. Samples will either be hand-delivered or a courier service will be used to deliver the samples to the appropriate laboratories.

Jon Gabry already has a preliminary bid from Accutest and a contact at the forensic lab in Massachusetts which he will e-mail to all on the conference call. Laboratory analyses for the forensic analyses should be a sole source to Accutest because of their specific forensic capabilities and analytical methods. Laboratory subcontracting will be conducted as per the Statement of Work received by SERAS via e-mail on 5/2/2013 which states the following:

Formatted: Highlight

Formatted: Highlight

1) It is recommended that samples for the following analyses listed be submitted to Accutest, MA (sole source justification):

   - B3328FINGHR GC Fingerprint, Alkanes and TPH by GC/FID
   - B5739ALKPAH PAHs & Alkylated PAHs by GC/MS/SIM
   - XCRA Hexavalent Chromium SW846 3060A/NJDEP 7196A
   - METDIG Metals Digestion
   - %SOL Percent Solids SM 2540B Mod

2) Deliverables from Lab to include all raw data (chromatograms, quantitation reports, histograms, instrument print-outs, etc.), a narrative, and forensic chromatographs and quantitation reports of best matches to known reference materials (e.g., mineral spirits, light naphtha, kerosene, diesel, gasoline, etc.).

   The routine parameters listed below will be submitted to the DESA or CLP lab via an Analytical Request Form to the RSCC. Standard data deliverables are expected.

   - TCL VOAs + 10 by SW-846 8260B
   - TCL SVOAs + 20 by SW-846 8270D
   - TAL Metals + Ti + Hg by SW-846 6020/7471

Field duplicates will be collected at a rate of 1:20.

Timely completion of the QAPP by SERAS will be based on the cooperation received by the subcontract laboratories in forwarding the information required (RLs, DLs, analytical SOPs, required sample volume).

DESA (specifically, Jon Gabry) wants to review the QAPP prior to it being finalized.

Action Items:

- The ERRS contractor is creating the HASP. Once it is complete, it will be forwarded to SERAS for the SERAS H&S to review and determine if it can be applied to SERAS personnel on-site.
- Jon Gabry will forward the Accutest quote he already has and his contact name at Accutest so that SERAS can expedite the award process.
- Donna Getty will write the Sole Source Justification (for forensic analyses by Accutest) with Rick Leuser's help.
- Jon Gabry wants analytical results in an Excel spreadsheet format. This will be a part of the bid matrix for DESA and Accutest.
- SERAS will provide an electronic data deliverable (EDD) in the form of a .csv file.
- SERAS will provide a cost-estimate to the ERT as soon as possible.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #10
Problem Definition

The problem to be addressed by the project: The 29 Riverside Avenue site is a former paint manufacturing facility located in an industrial area of Newark, NJ. The site consists of two buildings on approximately two acres. One building contains two abandoned 10,000-gallon above ground storage tanks (AST) containing hazardous waste, and the other building contains approximately one hundred 3,000 to 10,000-gallon ASTs and a subsurface impoundment. Ten 12,000-gallon underground storage tanks (USTs) containing hazardous waste, primarily volatile organic compounds (VOCs), are buried on the property. SERAS has been tasked by the ERT in support of EPA Region 2 to provide sampling and laboratory subcontracting support for investigative sampling which will be conducted in the basement of Building #7 on-site. The purpose of the sampling effort is to obtain a forensic analysis of soil/sludge material deposited in the basement of Building #7. The forensic analyses will be used to identify the contaminant profiles of the sludge/soil deposits in an effort to link the profiles to known and potential responsible parties (PRPs). Two small openings in the basement, vaults, will be accessed for sampling. Up to 6 soil/sludge borings will be advanced using direct push technology to obtain soil cores. The Emergency and Rapid Response Services (ERRS) contractor will be responsible for subcontracting a Geoprobe® Model 54LT (or equivalent) and its operator, and for the creation of the Health & Safety Plan (HASP) for the site work. SERAS will create the Quality Assurance Project Plan (QAPP), subcontract the Region 2 requested laboratories, provide sampling support on-site (supply glassware, collect samples from core sleeves, log cores, document samples, screen the soils using a photo-ionization detector [PID], maintain Scribe file), provide photo-documentation, ensure delivery of the samples to the appropriate labs, validate the hexavalent chromium (Cr[VI]) data, provide analytical report and logging summary, and final Scribe file.
The environmental questions being asked: Can the contaminant profile of the soil/sludge material located in the basement of Building #7 be determined? And if so, can this information be linked to known or potential PRPs?
Observations from any site reconnaissance reports: Two small openings (vaults) provide access to the soil/sludge material. The sludge is piled up close to the floor surface.
A synopsis of secondary data or information from site reports: NA
The possible classes of contaminants and the affected matrices: Soil/sludge: alkanes; total petroleum hydrocarbons (TPH) (i.e., mineral spirits, Stoddard, etc.); polycyclic aromatic hydrocarbons (PAHs); alkylated PAHs; Cr (VI); target analyte list (TAL) metals including titanium (Ti); target compound list (TCL) volatile organic analytes (VOAs); TCL semi-volatile analytes (SVOAs)
The rationale for inclusion of chemical and nonchemical analyses: To provide forensic support for identification of known and potential responsible parties.

Formatted: Highlight
Formatted: Highlight

Information concerning various environmental indicators: NA
Project decision conditions ("If..., then..." statements): If forensic analysis of the soil/sludge samples can identify a contaminant profile that can be linked to known or potential responsible parties, then EPA will determine the appropriate course of action.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #11
Project Quality Objectives /Systematic Planning Process Statements

Who will use the data? EPA Region 2 and ERT
What will the data be used for? The sampling effort is investigative in nature and resulting data will provide forensic support for the identification of the contaminant profiles of the soil/sludge located in the basement of Building #7.
What type of data is needed? (target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques) EPA Region 2 Division of Environmental and Assessment (DESA) laboratory will provide determinative analyses of the soil/sludge samples for TCL VOAs, TCL SVOAs, and TAL metals (including Hg and Ti). Analytical methods for DESA's analyses will include: • TCL VOAs + 10 by SW-846 8260B • TCL SVOAs + 20 by SW-846 8270D • TAL Metals + Ti + Hg by SW-846 6020/7471 Accutest New England laboratory will conduct a forensic analysis of the soil/sludge samples for alkanes, TPH, PAH, alkylated PAHs and Cr(VI) and will also determine percent solids for the samples. Analytical methods which Accutest New England Laboratories will use include: • B3328FINGHR GC Fingerprint, Alkanes and TPH by GC/FID: ASTM D3328-06 • B5739ALKPAH PAHs & Alkylated PAHs by GC/MS/SIM: ASTM D5739-06 • XCRA Hexavalent Chromium: SW846 3060A/NJDEP 7196A • METDIG Metals Digestion • %SOL Percent Solids SM 2540B Mod Logging will be in accordance with SERAS SOP #2074, *Description and Identification of Soils.* PID readings: Screening soils for health and safety worker protection.
How "good" do the data need to be in order to support the environmental decision? Screening data generated by a PID for H&S monitoring. Definitive data are required for the soil/sludge sample laboratory analyses. Worksheet #12 and #28 indicate the measurement performance criteria that are needed for the quality indicators. Worksheet #20 outlines the field quality control (QC) sample requirements.

Formatted: Highlight
Formatted: Highlight

How much data are needed? (number of samples for each analytical group, matrix, and concentration) Approximately 3 samples x 6 locations≈ 18 soil/sludge samples plus 1 field duplicate and 1 rinsate blank. Levels of contaminant concentrations are undetermined at this time, however low to medium levels are expected based on known site history. The ≈ 18 soil/sludge samples plus 1 field duplicate will be analyzed for TCL VOA + 10, TCL SVOA +20, and TAL metals including Ti. These samples will also undergo a forensic analysis for alkanes, TPH, PAHs, alkylated PAHs and Cr(VI). Percent solids will also be calculated for these samples. The rinsate blank will be collected at the completion of sampling activities to assess decontamination procedures and analyzed for TCL VOAs, TCL SVOAs, and TAL metals including Hg and Ti.
Where, when, and how should the data be collected/generated? Six soil borings will be advanced in the basement of Building #7. It is expected that 3 soil/sludge samples will be collected from each borehole location. The total number of samples is not expected to exceed 20, but the sample numbers, locations and depths will be determined by the EPA personnel on-site. Sampling will be conducted on June 10 and 11, 2013. Soil/sludge samples will be collected at EPA-specified depths. Samples will represent the top, middle and bottom soil/sludge layers per borehole location. Additional samples may be collected at the discretion of the EPA. Depths of sample collection will be based on visual inspection of the soil/sludge materials. Sampling will be conducted according to SERAS standard operating procedure (SOP) #2012, *Soil Sampling.* Cores will be logged by SERAS personnel. The logs and a brief summary will be provided to the ERT. Laboratory analytical results (raw, preliminary, and final), chromatograms, quantitation reports, histograms, instrument print-outs will be generated by DESA and New England Accutest Laboratories. Additionally, New England Accutest will provide forensic chromatographs and quantitation reports of the best matches of the contaminant profiles to known reference materials (e.g., mineral spirits, light naphtha, kerosene, diesel, gasoline, etc.).
Who will collect and generate the data? SERAS field personnel will collect field samples, screen the soil cores using a PID, and log the soils. DESA laboratory and Accutest New England laboratory personnel will conduct the sample analyses (refer to Worksheet #30).
How will the data be reported? Validated data for Cr(VI) will be submitted to the ERT WAM and SERAS TL in an analytical report prepared in accordance with SERAS SOP #4020, *Analytical Report Preparation* and in a comma separated value (.csv) file compatible with Scribe. Copies of the analytical data packages for hydrocarbon characteristics and PAH analyses will be posted to the ERT-IMS website for retrieval by the EPA Region 2 Hazardous Waste Support Branch Chief for review. These data will not be validated by SERAS personnel. Excel spreadsheets have been requested by the EPA R2 HWS Branch Chief as the final electronic deliverable from DESA and Accutest New England. Data will be disseminated to EPA Region 2 by the WAM.
How will the data be archived? Hard copies of all deliverables will be stored in SERAS Central Files. Electronic copies will be stored on SERAS Local Area Network (LAN). Data will be archived by SERAS in accordance with Administrative Procedure (AP) #34, *Archiving Electronic Files*.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #12-1
Measurement Performance Criteria Table

Matrix	Soil/Sludge
Analytical Group[1]	TAL Metals + Ti
Concentration Level	Low

Sampling Procedure[2]	Analytical Method/SOP[3]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
SERAS SOP #2012	DESA SOP #C-109,C-112, C-110	Precision (field)	±35% RPD	Field Duplicate	S & A
		Accuracy (field)	<RL	Rinsate Blank	S & A
		Precision	% RPD ±25	LCS Duplicate	A
		Accuracy	Limits: Average Recovery ± 25% Soil	LCS	A
		Accuracy	%R = 75-125%	Matrix spike	A
		Precision	< RL Except for Al, Fe, Ca, K, Mg and Na	Interference Check Sample (ICP/AES)	A
		Accuracy	< RL	Method Blank	A
		Precision	RPD < 20 %	Serial Dilution Test (ICP/AES)	A
		Accuracy	Range of 0.60-1.87 of the original response in the calibration blank	Internal Standards (ICP-MS)	A
SERAS SOP #2012	DESA SOP #C-109,C-112, C-110	Completeness	>90% sample collection >90% sample analysis	Data Completeness Check	S & A

Comment [DK2]: %D </- 10%??

Formatted: Highlight

Formatted: Highlight

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23
[3]Reference number from QAPP Worksheet #23

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #12-2
Measurement Performance Criteria Table

Matrix	Soil/Sludge
Analytical Group[1]	VOA
Concentration Level	Low

Sampling Procedure[2]	**Analytical Method/SOP**[3]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
SERAS SOP #2012	DESA SOP #C-123	Precision Accuracy	% RPD < 20 Average Recovery 70-130%	LCS Duplicate	A
		Precision (field)	±35% RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > RL	Rinsate Blank	S & A
		Accuracy	Factor of two(-50% to + 100%) from the initial/continuing calibration	Internal standards	A
		Accuracy	Compound Specific (full range: 17-259%)	Matrix spike	A
		Accuracy	Limits 70%-130%(Aqueous) Table 7 of C-123(low Soil)	Surrogate Compounds	A
		Accuracy	< RL	Method Blank	A
		Completeness	>90% sample collection >90% sample analysis	Data Completeness Check	S & A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23
[3]Reference number from QAPP Worksheet #23

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #12-3
Measurement Performance Criteria Table

Matrix	Soil/Sludge
Analytical Group[1]	SVOA
Concentration Level	Low

Sampling Procedure[2]	Analytical Method/SOP[3]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
SERAS SOP #2012	DESA SOP #C-90	Precision Accuracy	% RPD < 30 Compound Specific (full range: D-262%)	LCS Duplicate	A
		Precision (field)	±35% RPD	Field Duplicate	S & A
		Accuracy (field)	No analyte > RL	Rinsate Blank	S & A
		Accuracy	Factor of two(-50% to + 100%) from the initial/continuing calibration	Internal standards	A
		Accuracy	Compound Specific (full range: D-262%)	Matrix spike	A
		Accuracy	Limits 30%-120% for Base Neutrals Limits 20%-120% for Acids	Surrogate Compounds	A
		Accuracy	< RL	Method Blank	A
		Completeness	>90% sample collection >90% sample analysis	Data Completeness Check	S & A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23
[3]Reference number from QAPP Worksheet #23

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #12-4
Measurement Performance Criteria Table

Matrix	Soil/Sludge
Analytical Group[1]	Cr(VI)
Concentration Level	Low

Sampling Procedure[2]	**Analytical Method/SOP**[3]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
SERAS SOP #2012	SW846 3060A/7196A	Accuracy	%R = 80-120%	LCS	A
		Precision (field)	±35% RPD	Field Duplicate	S & A
		Accuracy	75-125% Recovery	Soluble and insoluble pre-digestion matrix spike	A
		Accuracy	85-115% Recovery (guideline)	Post-digestion matrix spike	A
		Precision	RPD ±20 (if both samples and dup are ≥ 4 times the lab RL); ± RL if sample or dup are < 4 times the lab RL	Soluble and Insoluble Laboratory Duplicate	A
		Accuracy	<RL	Method Blank	A
		Completeness	>90% sample collection >90% sample analysis	Data Completeness Check	S & A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23
[3]Reference number from QAPP Worksheet #23

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #12-5
Measurement Performance Criteria Table

Matrix	Soil/Sludge
Analytical Group	PAHs & Alkylated PAHs
Concentration Level	Low

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or Both (S&A)
SERAS SOP# 2012	Modified SW846 8270D & ASTM D5739-06	Precision (field)	±35% RPD	Field Duplicate	S & A
		Accuracy/Bias	<RL	Method Blank	A
		Accuracy/Bias	-50% to + 100%	Internal standard	A
		Accuracy/Bias	%R within control chart limits	Surrogate	A
		Accuracy/Bias	%R within control chart limits	LCS	A
		Precision	%RPD within laboratory control chart limits	Lab duplicate	A
		Accuracy/Bias	%R within control chart limits	Matrix Spike	A
		Completeness	>90% sample collection >90% sample analysis	Data Completeness Check	S & A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #12-6
Measurement Performance Criteria Table

Matrix	Soil/Sludge
Analytical Group	Alkanes and TPH
Concentration Level	NA

Sampling Procedure[1]	**Analytical Method/SOP**[2]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or Both (S&A)**
SERAS SOP# 2012	Modified SW846 8015B & ASTM D3328-06	Precision (field)	±35% RPD	Field Duplicate	S & A
		Accuracy/Bias	No analyte > ½ RL	Method Blank	A
		Accuracy/Bias	Within control chart limits	Matrix Spike	A
		Precision (lab)	Within control chart limits	Matrix Spike Duplicate	A
		Accuracy (contamination)	Within control chart limits	Blank Spike	A
		Accuracy/Bias	Within control chart limits	Surrogate	A
		Accuracy/Bias	<RL	DCM Baseline Blank	A
		Completeness	>90% sample collection >90% sample analysis	Data Completeness Check	S & A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23
[3]Reference number from QAPP Worksheet #23

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #13
Secondary Data Criteria and Limitations Table

Secondary Data	Data Source (Originating Organization, Report Title, and Date)	Data Generator(s) (Originating Org., Data Types, Data Generation/ Collection Dates)	How Data Will Be Used	Limitations on Data Use
Site Investigation	Birdsall Services Group Inc./ PMK Group, Inc. Draft Site Investigation 1700-1712 and 1702-1716 McCarter Highway October 2009	Birdsall Services Group Inc./ PMK Group, Inc. Laboratory analysis. Historical records, Geophysical survey	Used for site background information	More sampling needed to fill data gaps.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #14
Summary of Project Tasks

Sampling Tasks: Soil/sludge sampling will be conducted in accordance with SERAS SOP #2012, *Soil Sampling*. Soil borings will be advanced (by the ERRS subcontractor) up to 15 feet in depth or until refusal. An undisturbed core approximately 4 to 5 feet in length will be withdrawn. Acetate sleeves will be split and the sampled at EPA designated core intervals using dedicated equipment. Approximately 18 soil/sludge samples will be collected, 3 from each borehole location, at core intervals determined by EPA Region 2 personnel on-site. Sample documentation will be done in accordance with SERAS SOP #2002, *Sample Documentation*. One field duplicate from a specific core interval to be identified on-site by the EPA will be collected at a rate of 5%. Sludge for volatile analysis will be sampled using an encore directly from the acetate sleeve. Following collection, sludge will then be placed into a new clean aluminum pan, homogenized thoroughly then segregated into the proper sample jars. A field duplicate will follow the same procedure to access field sampling and analytical precision. SERAS personnel will screen the soil/sludge with a photoionization detector (PID) during sample collection and soil logging. Screening will be conducted according to SOP #2139, *Multi Gas Monitor PGM-50/Photoionization Detector (PID) MultiRAE Plus* and soil logging according to SOP #2074, *Description and Identification of Soils*.
Analysis Tasks: All samples will be analyzed per the details in Worksheet 19, Analytical SOP Requirements.
Quality Control Tasks: Refer to Worksheet #20 for field QC Samples and Worksheets #12 and #28 for analytical QC samples.
Secondary Data: Used for site background information
Data Management Tasks: All sampling locations will be identified by a field assigned number. Field sampling data will be recorded on field data sheets or in field logbooks. All sample location and other pertinent information will be entered into Scribe. Chains of custody records and sample labels will be generated using Scribe. All field samples will be delivered under chain of custody (COC) to DESA or Accutest laboratories. Laboratory procedures will be reviewed and the data verified for the appropriate quality assurance objectives. Analytical data will be imported into Scribe and the database file posted to the ERT-IMS website. All deliverables will be generated in accordance to the appropriate SERAS SOP and posted to the ERT- Information Management System (IMS) website upon completion. Posting to the ERT-IMS site will be considered as completion of the deliverable.
Documentation and Records: All documentation will be recorded in accordance with SERAS SOP #4001, *Logbook Documentation* and SOP #2002, *Sample Documentation*. Documents and records that may be generated during this project include: WP, QAPP, Field Logbooks, Sample Labels, COC Records, Custody Seals, Photo-documentation, Data Review Records, Data Reduction Records, Data Validation Records, Data Assessment Forms, Instrument Printouts, Analytical Results, Scribe Database, Analytical Report and Field Change Forms, if necessary.

Formatted: Highlight
Formatted: Highlight

Assessment/Audit Tasks:
No performance audit of field operations is anticipated for this project. The tasks associated with this QAPP are assessed using peer reviews and management system reviews. Peer review enables the field team to identify and correct reporting errors before reports are submitted. Management system reviews establish compliance with prevailing management structure, policies and procedures, and ensures that the required data are obtained.

Data Review Tasks:

DESA will verify and validate TCL VOAs; TAL metals, mercury, titanium and TCL SVOAs in accordance with the EPA Region 2 SOP #G-26, *Guidance for Laboratory Data Review*. Hexavalent chromium data will be validated in accordance with SERAS SOP #1017, *Data Validation Procedures for Routine Inorganic Analysis.* Raw data for PAHs and hydrocarbons will not be validated and will be forwarded to the EPA Region 2 HWS Branch Chief for review. All project deliverables will receive an internal peer review prior to release, per guidelines established in the SERAS AP #22, *Peer Review of SERAS Deliverables.* Accutest New England will provide a forensic case narrative, chromatographs, and quantitation reports identifying results of comparisons to known reference materials.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-1 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TCL VOAs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Method CRQLs (µg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits** (µg/kg)	Reporting Limits (µg/kg)
Dichlorodifluoromethane	75-71-8	NA	5	1.9	5
Chloromethane	74-87-3	NA	5	1.5	5
Vinyl Chloride	75-01-4	NA	5	1.9	5
Bromomethane	74-83-9	NA	5	1.9	5
Chloroethane	75-00-3	NA	5	1.5	5
Trichlorofluoromethane	75-69-4	NA	5	1.7	5
1,1-Dichloroethene	75-35-4	NA	5	1.7	5
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	NA	5	2.0	5
Carbon Disulfide	75-15-0	NA	5	2.0	5
Acetone	67-64-1	NA	10	5.8	10
Methyl Acetate	79-20-9	NA	5	2.8	5
Methylene Chloride	75-09-2	NA	5	1.8	5
trans-1,2-Dichloroethene	156-60-5	NA	5	1.9	5
cis-1,2-Dichloroethene	156-59-2	NA	5	2.2	5
Methyl tert-Butyl Ether	1634-04-4	NA	5	3.1	5
1,1-Dichloroethane	75-34-3	NA	5	1.7	5
2-Butanone	78-93-3	NA	10	4.0	10

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-1 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TCL VOAs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Method CRQLs (µg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits** (µg/kg)	Reporting Limits (µg/kg)
Chloroform	67-66-3	NA	5	2.3	5
1,2-Dichloroethane	107-06-2	NA	5	2.4	5
1,1,1-Trichloroethane	71-55-6	NA	5	2.0	5
Cyclohexane	110-82-7	NA	5	1.8	5
Carbon Tetrachloride	56-23-5	NA	5	1.9	5
Benzene	71-43-2	NA	5	2.0	5
Trichloroethene	79-01-6	NA	5	2.0	5
Methylcyclohexane	108-87-2	NA	5	2.3	5
1,2-Dichloropropane	78-87-5	NA	5	2.1	5
Bromodichloromethane	75-27-4	NA	5	2.2	5
cis-1,3-Dichloropropene	10061-01-5	NA	5	2.3	5
trans-1,3-Dichloropropene	10061-02-6	NA	5	2.5	5
1,1,2-Trichloroethane	79-00-5	NA	5	2.4	5
Dibromochloromethane	124-48-1	NA	5	2.2	5
4-Methyl-2-Pentanone	108-10-1	NA	10	4.0	10
Toluene	108-88-3	NA	5	1.9	5
1,2-Dibromoethane	106-93-4	NA	5	.4	5
Chlorobenzene	108-90-7	NA	5	.7	5
Tetrachloroethene	127-18-4	NA	5	2.5	5

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-1 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TCL VOAs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Method CRQLs (µg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits** (µg/kg)	Reporting Limits (µg/kg)
2-Hexanone	591-78-6	NA	10	4.0	10
Ethylbenzene	100-41-4	NA	5	1.9	5
m,p-Xylene	179601-23-1	NA	5	4.3	5
o-Xylene	95-47-6	NA	5	2.1	5
Styrene	100-42-5	NA	5	1.8	5
Bromoform	75-25-2	NA	5	2.6	5
Isopropylbenzene	98-82-8	NA	5	2.3	5
1,1,2,2-Tetrachloroethane	79-34-5	NA	5	3.0	5
1,3-Dichlorobenzene	541-73-1	NA	5	2.0	5
1,4-Dichlorobenzene	106-46-7	NA	5	1.9	5
1,2-Dichlorobenzene	95-50-1	NA	5	2.2	5
1,2-Dibromo-3-Chloropropane	96-12-8	NA	5	3.4	5
1,2,4-Trichlorobenzene	120-82-1	NA	5	1.9	5
1,2,3-Trichlorobenzene	87-61-6	NA	5	2.0	5

NA = Not Applicable; CRQLs = Contract Required Quantitation Limits
*This sampling effort is investigative in nature and will result in a forensic analysis to profile the contaminant concentrations. There are no associated Project Action Limits.
** MDL Study will be performed

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-2 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TCL SVOAs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Method CRQLs (µg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits (µg/kg)	Reporting Limits (µg/kg)
BENZALDEHYDE	100-52-7	NA	170	17.8	120
PHENOL	108-95-2	NA	170	15.7	120
BIS(2-CHLOROETHYL)ETHER	111-44-4	NA	170	17.7	120
2-CHLOROPHENOL	95-57-8	NA	170	5.18	120
2-METHYLPHENOL	95-48-7	NA	170	5.00	120
BIS(2-CHLOROISOPROPYL)ETHER	108-60-1	NA	170	5.33	120
ACETOPHENONE	98-86-2	NA	170	4.97	120
4-METHYLPHENOL	106-44-5	NA	170	5.57	120
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	NA	170	5.34	120
HEXACHLOROETHANE	67-72-1	NA	170	4.36	120
NITROBENZENE	98-95-3	NA	170	5.52	120
ISOPHORONE	78-59-1	NA	170	5.96	120
2-NITROPHENOL	88-75-5	NA	170	6.91	120
2,4-DIMETHYLPHENOL	105-67-9	NA	170	5.42	120
BIS(2-CHLOROETHOXY)METHANE	111-91-1	NA	170	5.14	120
2,4-DICHLOROPHENOL	120-83-2	NA	170	4.07	120
NAPHTHALENE	91-20-3	NA	170	6.13	120
4-CHLOROANILINE	106-47-8	NA	170	6.37	120

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-2 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TCL SVOAs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Method CRQLs (µg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits (µg/kg)	Reporting Limits (µg/kg)
HEXACHLOROBUTADIENE	87-68-3	NA	170	6.16	120
CAPROLACTAM	105-60-2	NA	170	9.16	120
4-CHLORO-3-METHYLPHENOL	59-50-7	NA	170	4.76	120
2-METHYL NAPHTHALENE	91-57-6	NA	170	5.42	120
HEXACHLOROCYCLOPENTADIENE	77-47-4	NA	170	3.05	120
1,2,4,5-TETRACHLOROBENZENE	95-94-3	NA	170	6.76	120
2,4,6-TRICHLOROPHENOL	88-06-2	NA	170	9.28	120
2,4,5-TRICHLOROPHENOL	95-95-4	NA	170	6.02	120
1,1'-BIPHENYL	92-52-4	NA	170	5.85	120
2-CHLORONAPHTHALENE	91-58-7	NA	170	5.99	120
2-NITROANILINE	88-74-4	NA	330	4.29	120
DIMETHYL PHTHALATE	131-11-3	NA	170	4.44	120
ACENAPHTHYLENE	208-96-8	NA	170	5.69	120
2,6-DINITROTOLUENE	606-20-2	NA	170	5.28	120
3-NITROANILINE	99-09-2	NA	330	4.25	120
ACENAPHTHENE	83-32-9	NA	170	6.26	120
2,4-DINITROPHENOL	51-28-5	NA	330	117	800
4-NITROPHENOL	100-02-7	NA	330	8.09	400

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-2 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TCL SVOAs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Method CRQLs (µg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits (µg/kg)	Reporting Limits (µg/kg)
DIBENZOFURAN	132-64-9	NA	170	5.97	120
2,4-DINITROTOLUENE	121-14-2	NA	170	1.97	120
2,3,4,6-TETRACHLOROPHENOL	58-90-2	NA	170	49.4	120
FLUORENE	86-73-7	NA	170	2.99	120
DIETHYLPHTHALATE	84-66-2	NA	170	2.43	120
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	NA	170	3.00	120
4-NITROANILINE	100-01-6	NA	330	5.13	120
4,6-DINITRO-2-METHYLPHENOL	534-52-1	NA	330	59.6	400
N-NITROSODIPHENYLAMINE	86-30-6	NA	170	3.54	120
4-BROMOPHENYL PHENYL ETHER	101-55-3	NA	170	4.74	120
HEXACHLOROBENZENE	118-74-1	NA	170	2.30	120
ATRAZINE	1912-24-9	NA	170	3.44	120
PENTACHLOROPHENOL	87-86-5	NA	330	67.5	400
PHENANTHRENE	85-01-8	NA	170	1.55	120
ANTHRACENE	120-12-7	NA	170	1.89	120
CARBAZOLE	86-74-8	NA	170	1.78	120
DI-N-BUTYL PHTHALATE	84-74-2	NA	170	5.22	120
FLUORANTHENE	206-44-0	NA	170	2.16	120

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-2 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TCL SVOAs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Method CRQLs (µg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits (µg/kg)	Reporting Limits (µg/kg)
PYRENE	129-00-0	NA	170	2.13	120
BUTYLBENZYLPHTHALATE	85-68-7	NA	170	3.65	120
3,3-DICHLOROBENZIDINE	91-94-1	NA	170	5.33	120
BENZO(A)ANTHRACENE	56-55-3	NA	170	5.24	120
CHRYSENE	218-01-9	NA	170	6.22	120
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NA	170	8.49	120
DI-N-OCTYL PHTHALATE	117-84-0	NA	170	5.44	120
BENZO(B)FLUORANTHENE	205-99-2	NA	170	2.47	120
BENZO(K)FLUORANTHENE	207-08-9	NA	170	4.87	120
BENZO(A)PYRENE	50-32-8	NA	170	3.97	120
INDENO(1,2,3-CD)PYRENE	193-39-5	NA	170	23.91	120
DIBENZO(A,H)ANTHRCENE	53-70-6-3	NA	170	1.38	120
BENZO(G,H,I)PERYLENE	191-24-2	NA	170	8.09	120

NA = Not Applicable; CRQLs = Contract Required Quantitation Limits
*This sampling effort is investigative in nature and will result in a forensic analysis to profile the contaminant concentrations. There are no associated Project Action Limits.
Note: Based on the new CRQLs the MDL study is currently being reanalyzed.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-3 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TAL Metals + Ti
Concentration Level: Low

Analyte	CAS Number	Project Action Limits	Method CRQLs (mg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits (mg/kg)	Reporting Limits (mg/kg)
Aluminum	7429-90-5	NA	20	**	10
Antimony	7440-36-0	NA	6	0.22	2
Arsenic	7440-38-2	NA	1	0.15	0.8
Barium	7440-39-3	NA	20	0.35	10
Beryllium	7440-41-7	NA	0.5	0.08	0.3
Cadmium	7440-43-9	NA	0.5	0.01	0.3
Calcium	7440-70-2	NA	500	4.7	50
Chromium	7440-47-3	NA	1	.054	0.5
Cobalt	7440-48-4	NA	5	0.29	2
Copper	7440-50-8	NA	2.5	0.29	1
Iron	7439-89-6	NA	10	*	5
Lead	7439-92-1	NA	1	0.23	0.8
Magnesium	7439-95-4	NA	500	3.7	50
Manganese	7439-96-5	NA	1.5	0.08	0.5
Mercury	7439-97-6	NA	0.1	0.03	0.05
Nickel	7440-02-0	NA	4	0.27	2
Potassium	7440-09-7	NA	500	17.1	50
Selenium	7782-49-2	NA	3.5	0.24	2
Silver	7440-22-4	NA	1	0.09	0.5

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-3 (DESA)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: TAL Metals + Ti
Concentration Level: Low

Analyte	CAS Number	Project Action Limits	Method CRQLs (mg/kg)	Achievable Laboratory Limits (DESA)	
				Method Detection Limits (mg/kg)	Reporting Limits (mg/kg)
Sodium	7440-23-5	NA	500	5.6	100
Thallium	7440-28-0	NA	2.5	0.29	2
Vanadium	7440-62-2	NA	5	0.11	2
Zinc	7440-66-6	NA	6	0.60	2
Titanium	7440-32-6	NA	NS	0.11	1

NS = Not Specified; NA = Not Applicable; CRQLs = Contract Required Quantitation Limits
*This sampling effort is investigative in nature and will result in a forensic analysis to profile the contaminant concentrations. There are no associated Project Action Limits.
**MDL study cannot be successfully performed on these analytes because of high background levels in matrix (sand).

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-4 (Accutest New England)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: Hexavalent Chromium (soluble and insoluble)
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Achievable Laboratory Limits (SW846 7196)	
			MDLs (mg/kg)	QLs (mg/kg)
Hexavalent Chromium	7740-47-3	NA	0.065	0.4

NS = Not Specified; NA = Not Applicable; *This sampling effort is investigative in nature and will result in a forensic analysis to profile the contaminant concentrations. There are no associated Project Action Limits; mg/kg = milligrams per kilogram

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-5 (Accutest New England)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: Alkanes & TPH
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Achievable Laboratory Limits (ASTM D3328-06)	
			MDLs (mg/kg)	QLs (mg/kg)
C-8		NA	0.0005	0.001
C-9		NA	0.0005	0.001
C-10		NA	0.0005	0.001
C-11		NA	0.0005	0.001
C-12		NA	0.0005	0.001
C-13		NA	0.0005	0.001
2,6,10-trimethyldodecane (1380)	3891-98-3	NA	0.0005	0.001
C-14		NA	0.0005	0.001
2,6,10-trimethyltridecane (1470)	3891-99-4	NA	0.0005	0.001
C-15		NA	0.0005	0.001
C-16		NA	0.0005	0.001
2,6,10-trimethylpentadecane (1650)	3892-00-0	NA	0.0005	0.001
C-17		NA	0.0005	0.001
Pristane	1921-70-6	NA	0.0005	0.001
C-18		NA	0.0005	0.001
Phytane	638-36-8	NA	0.0005	0.001
C-19		NA	0.0005	0.001
C-20		NA	0.0005	0.001
C-21		NA	0.0005	0.001
C-22		NA	0.0005	0.001
C-23		NA	0.0005	0.001
C-24		NA	0.0005	0.001
C-25		NA	0.0005	0.001
C-26		NA	0.0005	0.001
C-27		NA	0.0005	0.001
C-28		NA	0.0005	0.001

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-5 (Accutest New England)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: Alkanes & TPH
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Achievable Laboratory Limits (ASTM D3328-06)	
			MDLs (mg/kg)	QLs (mg/kg)
C-29		NA	0.0005	0.001
C-30		NA	0.0005	0.001
C-31		NA	0.0005	0.001
C-32		NA	0.0005	0.001
C-33		NA	0.0005	0.001
C-34		NA	0.0005	0.001
C-35		NA	0.0005	0.001
C-36		NA	0.0005	0.001
C-37		NA	0.0005	0.001
C-38		NA	0.0005	0.001
C-39		NA	0.0005	0.001
C-40		NA	0.0005	0.001
TPH (C8-C40)		NA	0.50	0.10

NS = Not Specified; NA = Not Applicable; *This sampling effort is investigative in nature and will result in a forensic analysis to profile the contaminant concentrations. There are associated Project Action Limits.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-6 (Accutest New England)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: PAHs & Alkylated PAHs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Achievable Laboratory Limits (ASTM D5739-06)	
			MDLs (µg/kg)	QLs (µg/kg)
Naphthalene	91-20-3	NA	5.0	10.0
2-Methylnaphthalene	91-57-6	NA	5.0	10.0
1-Methylnaphthalene	90-12-0	NA	5.0	10.0
C1-Naphthalenes		NA	5.0	10.0
C2-Naphthalenes		NA	5.0	10.0
C3-Naphthalenes		NA	5.0	10.0
C4-Naphthalenes		NA	5.0	10.0
Acenaphthylene	208-96-8	NA	5.0	10.0
Acenaphthene	83-32-9	NA	5.0	10.0
Dibenzofuran	132-64-9	NA	5.0	10.0
Fluorene	86-73-7	NA	5.0	10.0
C1-Fluorenes		NA	5.0	10.0
C2-Fluorenes		NA	5.0	10.0
C3-Fluorenes		NA	5.0	10.0
Dibenzothiophene	132-65-0	NA	5.0	10.0
C1-Dibenzothiophenes		NA	5.0	10.0
C2-Dibenzothiophenes		NA	5.0	10.0
C3-Dibenzothiophenes		NA	5.0	10.0
C4-Dibenzothiophenes		NA	5.0	10.0
Phenanthrene	85-01-8	NA	5.0	10.0
Anthracene	120-12-7	NA	5.0	10.0
C1-Phenanthrenes/Anthracenes		NA	5.0	10.0
C2-Phenanthrenes/Anthracenes		NA	5.0	10.0
C3-Phenanthrenes/Anthracenes		NA	5.0	10.0
C4-Phenanthrenes/Anthracenes		NA	5.0	10.0
Fluoranthene	206-44-0	NA	5.0	10.0
Pyrene	129-00-0	NA	5.0	10.0

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #15-6 (Accutest New England)
Reference Limits and Evaluation Table

Matrix: Soil/sludge
Analytical Group: PAHs & Alkylated PAHs
Concentration Level: Low

Analyte	CAS Number	Project Action Limits*	Achievable Laboratory Limits (ASTM D5739-06)	
			MDLs (µg/kg)	QLs (µg/kg)
C1-Fluoranthenes/Pyrenes		NA	5.0	10.0
C2-Fluoranthenes/Pyrenes		NA	5.0	10.0
C3-Fluoranthenes/Pyrenes		NA	5.0	10.0
Benzo(b)fluorene	243-17-4	NA	5.0	10.0
Benzo(c)fluorene	205-12-9	NA	5.0	10.0
2-Methylpyrene	3442-78-2	NA	5.0	10.0
4-Methylpyrene	3353-12-6	NA	5.0	10.0
1-Methylpyrene	2381-21-7	NA	5.0	10.0
Benzo(a)anthracene	56-55-3	NA	5.0	10.0
Chrysene	218-01-9	NA	5.0	10.0
C1-Benzo(a)anthracenes/Chrysenes		NA	5.0	10.0
C2-Benzo(a)anthracenes/Chrysenes		NA	5.0	10.0
C3-Benzo(a)anthracenes/Chrysenes		NA	5.0	10.0
C4-Benzo(a)anthracenes/Chrysenes		NA	5.0	10.0
Benzo(b)fluoranthene	205-99-2	NA	5.0	10.0
Benzo(k)fluoranthene	207-08-9	NA	5.0	10.0
Benzo(e)pyrene	192-97-2	NA	5.0	10.0
Benzo(a)pyrene	50-32-8	NA	5.0	10.0
Perylene	198-55-0	NA	5.0	10.0
Indeno(1,2,3-cd)pyrene	193-39-5	NA	5.0	10.0
Dibenzo(a,h)anthracene	53-70-3	NA	5.0	10.0
Benzo(g,h,i)perylene	191-24-2	NA	5.0	10.0

NS = Not Specified; NA = Not Applicable; *This sampling effort is investigative in nature and will result in a forensic analysis to profile the contaminant concentrations. There are associated Project Action Limits.

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #16
Project Schedule Timeline Table

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Soil/sludge sampling activities	SERAS	June 10, 2013	June 22, 2013	No	Not applicable
Laboratory Analysis	DESA	June 11, 2013	July 3, 2013 (Within business 15 days after receipt of samples)	Yes	July 3, 2013 (Within business 15 days after receipt of samples)
Forensic Laboratory Analysis and Reporting	Accutest	June 11, 2013	July 3, 2013 (Within business 15 days after receipt of samples)	Yes (complete data package)	July 3, 2013 (Within business 15 days after receipt of samples)
Validation of Hexavelent Chromium Analytical Results	SERAS	Upon receipt of final data package from Accutest	Within 15 business days of receipt of final data package from Accutest	Yes (Analytical Report and .csv file)	Within 15 business days of receipt of final data package from Accutest

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #17
Sampling Design and Rationale

Describe and provide a rationale for choosing the sampling approach (e.g., grid system, biased statistical approach): Sampling is being conducted to support an enforcement effort and is investigative in nature. Sampling will be biased to support forensic analysis of the sludge material. Six boreholes will be advanced by the ERRS contractor at locations designated by EPA Region 2. Core intervals/depths to be sampled will be determined by the EPA. Determination will be based on visual inspection of the sludge material and the known history of the site. Samples will be collected to profile the top, middle and bottom layers of the sludge material. Additional sample depths may be collected at the discretion of the EPA personnel on-site.
Describe the sampling design and rationale in terms of what matrices will be sampled, what analytical groups will be analyzed and at what concentration levels, the sampling locations (including QC, critical, and background samples), the number of samples to be taken, and the sampling frequency (including seasonal considerations) [May refer to map or Worksheet #18 for details]: Soil/sludge sampling will be conducted in accordance with SERAS SOP #2012, *Soil Sampling*. Soil borings will be advanced (by the ERRS subcontractor) up to 15 feet in depth or until refusal. An undisturbed core approximately 4 to 5 feet in length will be withdrawn. Acetate sleeves will be split and then sampled at EPA designated core intervals using dedicated equipment. Approximately 18 soil/sludge samples will be collected, 3 from each borehole location, at core intervals determined by the EPA Region 2 personnel on-site. One field duplicate from a specific core interval to be identified on-site by the EPA will be collected at a rate of 5%. Sludge for volatile analysis will be sampled using an encore directly from the acetate sleeve. Following collection, sludge will then be placed into a new clean aluminum pan, homogenized thoroughly then segregated into the proper sample jars. A field duplicate will follow the same procedure to access field sampling and analytical precision. SERAS personnel will screen the soil/sludge, for H& S purposes, with a photo-ionization detector (PID) during sample collection and log the soils. Screening will be conducted according to SOP #2139, *Multi Gas Monitor PGM-50/Photoionization Detector (PID) MultiRAE Plus* and soil logging according to SOP #2074, *Description and Identification of Soils*.

Comment [RL3]: Will the borings be through cores made in the floor? Or over the edge of the floor openings? Do we have a diagram of planned core locations?

Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #18-1
Sampling Locations and Methods/SOP Requirements Table (Enforcement Sampling)

Sampling Location/ID Number	Matrix	Depth (Feet)	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)[1]	Sampling SOP Reference[2]	Rationale for Sampling Location
BH1-1	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH1-2	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH1-3	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH2-1	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #18-1
Sampling Locations and Methods/SOP Requirements Table (Enforcement Sampling)

Sampling Location/ID Number	Matrix	Depth (Feet)	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)[1]	Sampling SOP Reference[2]	Rationale for Sampling Location
BH2-2	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH2-3	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH4-1	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH4-2	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids)	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #18-1
Sampling Locations and Methods/SOP Requirements Table (Enforcement Sampling)

Sampling Location/ID Number	Matrix	Depth (Feet)	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)[1]	Sampling SOP Reference[2]	Rationale for Sampling Location
BH4-3	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH5-1	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH5-2	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH5-3	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #18-1
Sampling Locations and Methods/SOP Requirements Table (Enforcement Sampling)

Sampling Location/ID Number	Matrix	Depth (Feet)	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)[1]	Sampling SOP Reference[2]	Rationale for Sampling Location
BH6-1	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH6-2	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action
BH6-3	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #18-1
Sampling Locations and Methods/SOP Requirements Table (Enforcement Sampling)

Sampling Location/ID Number	Matrix	Depth (Feet)	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)[1]	Sampling SOP Reference[2]	Rationale for Sampling Location
Additional samples may be collected at the discretion of the EPA OSC; sample ID will follow the same nomenclature as the above samples.	Soil/Sludge	TBD	VOC, SVOC, TAL metals (including Hg and Ti); fingerprint analysis for alkanes and TPH, PAHs & alkylated PAHs, Cr(VI), metals digestion, % solids	Low	1	SERAS SOP #2012	Biased; based on visual inspection; in support of an enforcement action

[1]One duplicate sample will be collected. Location will be determined by the EPA personnel on-site.
[2]Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #21).

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #19
Analytical SOP Requirements Table

Matrix	No. of Samples	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference[1]	Sample Volume	Containers (number, size, and type)	Preservation Requirements	Maximum Holding Time (preparation/ analysis)
Soil/sludge	20	VOC	Low	SW-846 8260B C-123 (*Ref:* SOM01.1)	5 g	(3) 5-gram Encore (9) 5-gram Encore for MS/MSD	Cool to 4°C	14 days
Soil/sludge	20	SVOC	Low	SW-846 8270D C-90 *(Ref: EPA 625)*	150 g	(1) 4-oz clear- glass jar w/Teflon lined cap (2) 4-oz. clear glass for MS/MSD	Cool to 4°C	14 days extract; 40 days analyze
Soil/sludge	20	Metals (including Hg and Ti)	Low	SW-846 6020/7471	Fill to capacity	(1) 4-oz clear- glass jar w/Teflon lined cap (2) 4-oz. clear glass for MS/MSD	Cool to 4°C	180 days (Hg-28 days)
Soil/sludge	20	Fingerprint, Alkanes, and TPH and PAHs & Alkylated PAHs	NA	SW846 8015B (Mod) ASTM D3328-06 & SW846 8270D (Mod) ASTM D5739-06		(1) 4 oz. glass jar w/Teflon lined cap	4± 2°C	Extraction within 14 days/ Analysis within 40 days of extraction
Soil/sludge	20	Hexavalent chromium	NA	SW846 3060A/ NJDEP 7196A	2.5 g	(2) 4 oz. amber glass jar w/Teflon lined cap (zero head space)	Field-moist at 4± 2°C	30 days to extract/ an additional 7 days to analyze

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #19
Analytical SOP Requirements Table

Matrix	No. of Samples	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference[1]	Sample Volume	Containers (number, size, and type)	Preservation Requirements	Maximum Holding Time (preparation/ analysis)
Soil/sludge	20	Percent Solids	NA	SM 2540 B Mod	20 g	(1) 4 oz. amber glass jar w/Teflon lined cap	Cool to 4°C	14 days
Rinsate Blank	1	VOC	Low	DW-1 (*Ref: EPA 524.2)* C-89 (*Ref: EPA 624*)	120 ml	(3) 40 ml vials w/Teflon lined septum	1:1 HCl to pH<2; cool to 4°C	14 days
Rinsate Blank	1	SVOC	Low	C-90 *(Ref: EPA 625*	2000 ml	(2) 1L amber glass bottles w/Teflon lined cap	Cool to 4°C	7 days extract, 40 days analyze
Rinsate Blank	1	Metals (including Hg and Ti)	Low	C-109, C-116 (*Ref: EPA 200.7)* C- 110, C-112 (*Ref: EPA 245.1*)	500 ml	(1) 1 L HDPE	HNO_3 to pH<2; cool to 4°C	6 months (Hg-28 days)

[1]Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23).

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #20
Field Quality Control Sample Summary Table (Enforcement Sampling)

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of Extra Volume Laboratory QC (e.g., MS/MSD) Samples	No. of Rinsate Blanks	No. of Trip. Blanks	No of PE Samples
Soil/sludge	VOC	Low	SW-846 8260B C-123 (*Ref:* SOM01.1)	18	1	1	1	NA	NA
	SVOC	Low	SW-846 8270D C-90 *(Ref: EPA 625)*	18	1	1	1	NA	NA
	TAL metals (including Hg and Ti)	Low	SW-846 6020/7471 C-109, C-116 (*Ref: EPA 200.7)* C- 110, C-112 (*Ref: EPA 245.1)*	18	1	1	1	NA	NA
	Fingerprint, alkanes and TPH	NA	SW846 8015B (Mod) ASTM D3328-06	18	1	0	0	NA	NA
	PAHs & Alkylated PAHs	NA	SW846 8270D (Mod) ASTM D5739-06	18	1	0	0	NA	NA
	Hexavalent Chromium	Low	SW846 3060A/NJDEP 7196A	18	1	0	0	NA	NA
	Percent Solids	NA	SM 2540 B Mod	18	1	0	0	NA	NA

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #21
Project Sampling SOP References Table

Reference Number	Title, Revision Date and/or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
2001	General Field Sampling Guidelines	SERAS	General Sampling	N	
2002	Sample Documentation, 10/3/94	SERAS	NA	N	
2003	Sample Storage, Preservation and Handling	SERAS	Sample Handling	N	
2004	Sample Packaging and Shipment, 11/30/00	SERAS	NA	N	
2012	Soil Sampling, Revision 1.0, 7/11/01	SERAS	Dedicated equipment	N	
2074	Description and Identification of Soils	SERAS	NA	NA	
2139	Multi Gas Monitor PGM-50/Photoionization Detector (PID) MultiRAE Plus, 11/22/05	SERAS	MultiRAE	N	
4005	Chain of Custody Procedures	SERAS	NA	N	

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #22
Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
MultiRAE/ AreaRAE 10.6 eV PID	Zero and Span Cal	Clean PID sensor and lamp as needed, download and clear datalogger	Bump	Check keypad, LCD screen working, check datalogger	Calibrate before use/monthly/ as needed	+/- 10%	Check gas concentration. Recalibrate, or clean sensor and lamp and recalibrate	Field Personnel	SERAS SOP #2139

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #23
Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work?
DESA SOP #C-123	Analysis of Volatile Organic Compounds by Automated Closed System by Purge and Trap GC/MS, Rev 2.3	Definitive	TCL VOAs	GC/MS	DESA	
DESA SOP #C-90	Analysis of Base/Neutral and Acid Compounds in Aqueous, Soil/Sediment and Waste Oil/Waste Organic Solvent Samples, Rev 2.3	Definitive	TCL SVOAs	GC/MS	DESA	
DESA SOP #109	Determination of Trace Elements in Aqueous Trace Metals in Aqueous, Soil/Sediment/Sludge-ICP-AES, Rev 3.2	Definitive	ICP-AES Metals	ICP	DESA	
DESA SOP #110	Mercury Analysis in Water and Soil/Sediments By CVAAS, Rev 2.3	Definitive	Hg	CVAA	DESA	
DESA SOP #112	Trace Metals in Aqueous, Soil/Sediment/Sludge, Waste Oil/Organic Solvent and Biological tissue by Inductively Coupled Plasma-Mass Spectrometry, Rev 3.2	Definitive	ICP-MS Metals	ICP	DESA	
SW846 8015 B (Mod.) ASTM D3328-06	Accutest Laboratories SOP MGC329-01, Determination of n-Alkanes, Isoprenoid Hydrocarbons, and Hydrocarbon Ranges by Gas Chromatography with Flame Ionization Detection, 8/28/2012	Definitive	Fingerprint, Alkanes and TPH	GC/FID	Accutest New England	
SW846 8270D (Mod.) ASTM D5739-06	Accutest Laboratories SOP MMS333-03, Determination of Polycyclic Aromatic Hydrocarbons by Gas Chromatography with Mass Spectrometric Detection Using the Selective Ion Monitoring Mode (GC/MS/SIM), Rev. Date 7/11/12	Definitive	PAHs & Alkylated PAHs	GC/MS/SIM	Accutest New England	
SW846 3060A/ NJDEP 7196A	Accutest Laboratories SOP MGN079-08, Hexavalent Chromium in Soil, Rev. 03/21/13	Definitive	Cr(VI)	Spectrophotometer	Accutest New England	

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #23
Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work?
SM 2540B Mod	Total Solids Dried at 103-105°C	Definitive	Percent Solids	Balance/Oven	Accutest New England	

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #24
Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference[1]
GC/MS SIM	PFTBA tune followed by a mass discrimination check. Initial calibration consisting of at least 6 levels of varying concentrations prior to sample analysis. For alkyl PAH homologs a crude oil standard must be analyzed prior to analyzing any samples to obtain proper RT windows.	Initial calibration after instrument setup and properly tuned. Continuing calibration - Tune instrument/check initial calibration every 12 hours during sample CCV standard analyzed at the beginning of every sequence, after every 10 samples at a minimum, and at the end of the sequence.	Initial calibration – %RSD of RRFs for individual analytes<25% and <15% for average of analytes in the method. If a linear regression is applied then R^2>0.995. ICV<20% difference of true value. CCV: %D between CCV RRFs and ICAL average RRFs for compounds of interest <25% and <15% on the average	Inspect instrument; correct problem; rerun calibration and re-extract and/or reanalyze affected samples.	Analyst	SW846 8270D Modified (ASTM 5739-06)
GC/FID	Initial calibration consisting of at least 6 levels of varying concentrations prior to sample analysis. If hydrocarbon range concentrations are to be determined, the mean response for each n-alkane with in the specified hydrocarbon range must be determined and entered into the calibration table for the specific range.	Initial calibration prior to sample analysis. CCV standard analyzed at the beginning of every sequence, after every 10 samples at a minimum with a mid-level standard	Initial calibration - %RSD <20%. If a linear regression is applied then R^2>0.990. ICV<15% CCV<20%	Inspect instrument; correct problem; rerun calibration and re-extract and/or reanalyze affected samples	Analyst	SW846 8015B Modified (ASTM D3328-06)

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #24
Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference[1]
Spectrophoto-meter	Initial calibration consisting of 6 concentrations and a blank, followed by an ICV	Initial calibration prior to sample analysis, immediately followed by ICV/ICB, CCV and CCB every 10 samples and at end of run	Correlation coefficient t≥0.995 ICV<10% CCV within 10% of true value, ICB/CCB <RL Post-digestate recovery 85-115%	Inspect instrument; correct problem; rerun calibration and re-extract and/or reanalyze affected samples	Analyst	SW846 3060A/ 7196A
ICP-AES	See SOP C-109	See SOP C-109	See SOP C-109	See SOP C-109	Assigned Lab personnel	SOP C-109
ICP-MS	See SOP C-112	See SOP C-112	See SOP C-112	See SOP C-112	Assigned Lab personnel	SOP C-112
CVAA	See SOP C-110	See SOP C-110	See SOP C-110	See SOP C-110	Assigned Lab personnel	SOP C-110

[1]Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23).

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #25
Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing/Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
GC/MS SIM	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Analyst	SW846 8270D Modified (ASTM 5739-06)
GC/FID	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Analyst	SW846 8015B Modified (ASTM D3328-06)
Spectrophoto-meter	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Per Accutest Laboratories standard operating procedures	Analyst	SW846 3060A/ 7196A
ICP-AES	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19
ICP-MS	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19
Mercury Analyzer	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19	See LQMP, G-10, G-11, G-12, G-19

[1]Specify the appropriate reference letter or number from Analytical SOP References table (Worksheet #23)

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #26
Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): Sandra Richards, Martin Ebel/SERAS
Sample Packaging (Personnel/Organization): Sandra Richards, Martin Ebel/SERAS
Coordination of Shipment (Personnel/Organization): Sandra Richards, Martin Ebel/SERAS
Type of Shipment/Carrier: Federal Express, personal delivery, laboratory courier (Accutest Laboratory in Dayton, NJ will provide a courier to pick up and deliver the forensic samples to their forensic laboratory in Marlborough, MA).
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Sample Custodian, DESA Laboratory and Accutest laboratories
Sample Custody and Storage (Personnel/Organization): Sample Custodian, DESA Laboratory and Accutest laboratories
Sample Preparation (Personnel/Organization): DESA Laboratory and Accutest New England
Sample Determinative Analysis (Personnel/Organization): Sample Technicians, DESA Laboratory and Accutest New England
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Samples to be shipped and/or couriered the same day as collected, and arrive at laboratory within 24 hours (1 day) of being sampled.
Sample Extract/Digestate Storage (No. of days from extraction/digestion): NA
Biological Sample Storage (No. of days from sample collection): NA
SAMPLE DISPOSAL
Personnel/Organization: Sample Technicians, DESA Laboratory and Accutest New England
Number of Days from Analysis: According to DESA Laboratory protocols Accutest New England protocols

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #27
Sample Custody Requirements

Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory): Chain of Custody records will be generated for all samples submitted for analysis. COC records will be prepared in accordance with SERAS SOP #4005, *Chain of Custody Procedures*. Samples will be shipped or couriered each day to the appropriate laboratory. Accutest Laboratory in Dayton, NJ will provide a courier to pick up and deliver the forensic samples to their forensic laboratory in Marlborough, MA.
Laboratory Sample Custody Procedures (receipt of samples, archiving and disposal): A sample custodian at the respective outside laboratories will accept custody of the shipped samples, check them for discrepancies, integrity, etc.
Sample Identification Procedures: The outside laboratory will assign a unique laboratory identifier to each sample during sample login.
Chain-of-custody Procedures: SERAS SOP #4005, *Chain of Custody Procedures*

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-1
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	TAL Metals + Ti
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-109,C-112, C-110
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Rinsate Blank	1 per event	<RL	Document/Report	Task Leader	Accuracy Contamination	< RL
Field Duplicate	1 in 20	±35%	Document/Report	Task Leader	Precision	±35%
Tuning/System Stability(ICP-MS)	As per C-112	Pass all the tune/stability criteria	Check Instrument Reanalyze, Retune	Lab personnel	Sensitivity	Pass all the tune/stability criteria
Initial Calibration Verification	Immediately following each calibration ,after every 10 samples and at the end of each analytical run	90%-110%	Check Instrument, Reanalyze	Lab personnel	Accuracy	90%-110%

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-1
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	TAL Metals + Ti
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-109,C-112, C-110
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Continuing Calibration Check Standard (Alternate check standard)	Every 10 samples and at the end of each analytical run	80%-120%	Reanalyze, Qualify data	Lab personnel	Accuracy	80%-120%
Initial Calibration Blank(ICB)	After ICV	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
Continuing Calibration Blank(CCB)	After every CCV	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
Low Level Check Standard	At Beginning and end of each analytical run	± 30% of the true value	Check Instrument, Re-calibrate	Lab personnel	Accuracy	± 30% of the true value
Interference Check Sample(ICP-200.7)	At Beginning and end of each analytical run	< RL Except Al ,Fe, Ca, K, Mg and Na	As per C-109	Lab personnel	Precision	< RL Except Al ,Fe, Ca, K, Mg and Na

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-1
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	TAL Metals + Ti
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-109,C-112, C-110
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank	1 per extraction batch of ≤ 20 samples	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
LCS/LFB	2 per extraction batch of ≤ 20 samples	Limits: Average Recovery ± 25% Soil, % RPD <25 Soil	Qualify data	Lab personnel	Accuracy/ Precision	Limits: Average Recovery ± 25% Soil, % RPD <25 Soil
Laboratory Matrix spikes	1 per extraction batch of ≤ 20 samples	Limits ± 25% Soil	Qualify data	Lab personnel	Accuracy	Limits ± 25% Soil
Serial Dilution Test (ICP-200.7)	Matrix spike sample	RPD < 20 %	Qualify data	Lab personnel	Precision	RPD < 20 %

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-1
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	TAL Metals + Ti
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-109,C-112, C-110
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal Standards(ICP-MS 200.8)	Each sample, standard, blank	Range of 0.60-1.87 of the original response in the calibration blank	Check Instrument Analyse / Qualify data	Lab personnel	Quantitation	Range of 0.60-1.87 of the original response in the calibration blank

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-2
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	VOC
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-123
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Tuning	12 hr period	Pass all PBFB tune criteria	Check Instrument Reanalyze, Retune	Lab personnel	Sensitivity	Pass all PBFB tune criteria
Initial Calibration	SOP C-123	% RSD +/- 50% Min RRF 0.010	Check Instrument, Reanalyze	Lab personnel	Accuracy/ Precision	% RSD +/- 50% Min RRF 0.010
Continuing Calibration Check Standard (Alternate check standard)	1 per analytical batch of 20 samples	Max %D listed in Table 4A of C-123	Reanalyze, Qualify data	Lab personnel	Accuracy	Max %D listed in Table 4A of C-123
Method Blank	1 per extraction batch of 20 samples	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
Rinsate Blank	1 per event	<RL	Document/Report	Task Leader	Accuracy Contamination	< RL

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-2
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	VOC
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-123
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate	1 in 20	+/-35%	Document/Report	Task Leader	Precision	+/-35%
LCS/LFB	2 per extraction batch of 20 samples	Limits: Average Recovery 70-130% % RPD < 20	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy/ Precision	Limits: Average Recovery 70-130% % RPD < 20
Laboratory Matrix spikes	1 per extraction batch of 20 samples	Table 8 of C-123 compound specific (full range- 17-259%)	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy	Table 8 of C-123 compound specific (full range- 17-259%)
Internal Standards	Each sample, standard, blank	Factor of two(-50% to + 100%) from the initial/continuing calibration	Check Instrument Analyses / Qualify data	Lab personnel	Quantitation	Factor of two(-50% to + 100%) from the initial/continuing calibration
Surrogates	Each sample, standard, blank	Table 7 of C-123	Re-inject, Qualify data	Lab personnel	Extraction efficiency, Accuracy	Table 7 of C-123

Formatted: Highlight
Formatted: Highlight

Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #28-3
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	SVOC
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-90
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Rinsate Blank	1 per event	<RL	Document/Report	Task Leader	Accuracy Contamination	< RL
Field Duplicate	1 in 20	+/-35%	Document/Report	Task Leader	Precision	+/-35%
Tuning	12 hr period	Pass all DFTPP tune criteria	Check Instrument Reanalyze, Retune	Lab personnel	Sensitivity	Pass all DFTPP tune criteria
Initial Calibration	SOP C-90	% RSD +/- 35% Allowed to fail 10% of total number of analytes but % RSD not be more than 60%	Check Instrument, Reanalyze	Lab personnel	Accuracy/Precision	% RSD +/- 35%Allowed to fail 10% of total number of analytes but % RSD not be more than 60%

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-3
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	SVOC
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-90
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

Continuing Calibration Check Standard (Alternate check standard)	1 per analytical batch of ≤ 20 samples	Min RRF 0.05 Max %D +/- 20% 10% of total analytes allowed to fail but not more than 60%	Reanalyze, Qualify data	Lab personnel	Accuracy	Min RRF 0.05 Max %D RRF +/- 20% 10% of total analytes allowed to fail but not more than 60%
Method Blank	1 per extraction batch of ≤ 20 samples	< RL	Investigate source of contamination	Lab personnel	Sensitivity Contamination	< RL
LCS/LFB	2 per extraction batch of ≤ 20 samples	Limits listed in Table3 in SOP C-90 for aqueous, manufacture's limits for soil % RPD < 30	Qualify data unless high recovery and/or Not Detected)	Lab personnel	Accuracy/ Precision	Limits listed in Table3 in SOP C-90 for aqueous, manufacture's limits for soil % RPD < 30
Laboratory Matrix spikes	1 per extraction batch of ≤ 20 samples	Limits listed in Table3 in SOP C-90	Qualify data unless high recovery and/or Not Detected	Lab personnel	Accuracy	Limits listed in Table3 in SOP C-90

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-3
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	SVOC
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	DESA SOP #C-90
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	USEPA Region 2 DESA Lab
No. of Sample Locations	6 borings approx. 18 samples

Internal Standards	Each sample, standard, blank	Factor of two (-50% to -100%)	Check Instrument Analyses / Qualify data	Lab personnel	Quantitation	Factor of two (-50% to -100%)
Surrogates	Each sample, standard, blank	30%-120% for Base Neutrals 20-120% for Acids	Re-inject, Qualify data as per SOP C-90	Lab personnel	Extraction efficiency, Accuracy	30%-120% for Base Neutrals 20-120% for Acids

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-4
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	Cr(VI)
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	SW846 3060A/ 7196A
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	Accutest New England
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate	1 in 20	RPD ±-35%	Document/ Report	Task Leader	Precision	+/-35%
LCS	Per batch	%R = 80-120%	Re-analyze	Analyst	Accuracy	%R = 80-120
Soluble and insoluble pre-digestion matrix spike	Per batch	75-125% Recovery	Rehomogenize, redigest, reanalyze	Analyst	Accuracy	75-125% Recovery
Post-digestion matrix spike	Per batch	85-115% Recovery	Rehomogenize, redigest, reanalyze	Analyst	Accuracy	85-115% Recovery

Formatted Table

Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #28-4
QC Samples Table

Matrix	Soil/Sludge					
Analytical Group	Cr(VI)					
Concentration Level	Low					
Sampling SOP	SERAS SOP #2012					
Analytical Method/ SOP Reference	SW846 3060A/ 7196A					
Sampler's Name	S. Richards, M. Ebel					
Field Sampling Organization	SERAS					
Analytical Organization	Accutest New England					
No. of Sample Locations	6 borings approx. 18 samples					
Laboratory Duplicate	Per batch	RPD ≤ 20 if both sample and dup are ≥ 4 times the lab RL); ± RL if sample or dup are < 4 times the lab RL	Qualify data	Analyst	Precision	RPD ≤ 20 if both LCS and sampleare ≥ 4 times the lab RL); ± RL if sample or dup are < 4 times the lab RL
Preparation Blank	Per batch	<RL	Reanalyze~~t~~	Analyst	Accuracy	<RL

Formatted Table

Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #28-5
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	PAHs & Alkylated PAHs
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	Modified SW-846 8270D
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	Accutest New England
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate	1 in 20	+/-35%	Document/Report	Task Leader	Precision	+/-35%
Method Blank	1 per batch of 20 samples	<RL	Suspend analysis, investigate source of contamination, re-extract	Analyst	Accuracy/Bias	<RL
Internal Standards	each sample	-50% to +100%	Check calculations and instruments, reanalyze affected samples	Analyst	Accuracy/Bias	-50% to +100%

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-5
QC Samples Table

Matrix	Soil/Sludge
Analytical Group	PAHs & Alkylated PAHs
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	Modified SW-846 8270D
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	Accutest New England
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Surrogate	each sample	%R within control chart limits	Re-analyze; re-extract	Analyst	Accuracy/Bias	%R within control chart limits
Matrix Spike	1 per extraction batch	%R within control chart limits	Report recoveries if LCS is within acceptance limits	Analyst	Accuracy	%R within control chart limits
Laboratory Duplicate	1 per extraction batch	RPD within control chart limits	Reanalyze, rerun batch or qualify data	Analyst	Precision	RPD within control chart limits
LCS	1 per extraction batch	%R within control chart limits	Reanalyze, rerun batch or qualify data	Analyst	Accuracy	%R within control chart limits

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-6
QC Samples Table

Matrix	Soil/sludge
Analytical Group	Alkanes & TPH
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	Modified SW-846 8015C
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	Accutest New England
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Field Duplicate	1 in 20	+/-35%	Document/Report	Task Leader	Precision	+/-35%
Method Blank	One per batch	No analyte >1/2 RL	Suspend analysis, investigate source of contamination, re-extract unless samples are non-detect	Analyst	Accuracy/Bias	No analyte > ½ RL
Matrix Spike	One per batch	Within control chart limits	Document/ report	Analyst	Accuracy/Bias	Within control chart limits
Matrix Spike Duplicate	One per batch	Within control chart limits	Document/ report	Analyst	Precision	Within control chart limits

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #28-6
QC Samples Table

Matrix	Soil/sludge
Analytical Group	Alkanes & TPH
Concentration Level	Low
Sampling SOP	SERAS SOP #2012
Analytical Method/ SOP Reference	Modified SW-846 8015C
Sampler's Name	S. Richards, M. Ebel
Field Sampling Organization	SERAS
Analytical Organization	Accutest New England
No. of Sample Locations	6 borings approx. 18 samples

QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Blank Spike	One per batch	Within control chart limits	Re-extract batch or qualify data	Analyst	Accuracy (contamination)	Within control chart limits
Surrogate	Each sample and standard	Within control chart limits	Check calculations, re-analyze samples if needed	Analyst	Accuracy/Bias	Within control chart limits
DCM Baseline Blank	After every CCV	<RL	Reanalyze	Analyst	Accuracy/Bias	<RL

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #29
Project Documents and Records Table

Sample Collection Documents and Records	Analysis Documents and Records	Data Assessment Documents and Records	Other
Chain of custody records Sample labels Custody seals Site Logbook Air Bills Photo-documentation	Sample receipt logs Internal and external COC forms Telephone/email logs Corrective action documentation Analytical Results Chromatograms Quantitation reports Instrument print-outs	Review forms for electronic entry of data into database Data Assessment Forms (Cr+6 only) Data Validation Check records (Cr+6 only)	Analytical Report Analytical Results EDD Scribe Database

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #30
Analytical Services Table

Matrix	Analytical Group	Concentration Level	Analytical SOP	Sample Location/ID Numbers	Data Package Turnaround Time	Laboratory/Organization (Name and Address, Contact Person and Telephone Number)	Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number
Soil/sludge	TCL VOCs	Low	SW-846 8260B	See Worksheet #18	15 business days	EPA Region 2 DESA Laboratory 2890 Woodbrige Ave., Edison, NJ 08837	NA
Soil/sludge	TCL SVOCs	Low	SW-846 8270D	See Worksheet #18	15 business days	EPA Region 2 DESA Laboratory 2890 Woodbrige Ave., Edison, NJ 08837	NA
Soil/sludge	TAL Metals (Including Hg and Ti)	Low	SW-846 6020/7471	See Worksheet #18	15 business days	EPA Region 2 DESA Laboratory 2890 Woodbrige Ave., Edison, NJ 08837	NA
Soil/sludge	GC Fingerprint, alkanes and TPH	NA	Modified SW-846 Method 8015C	See Worksheet #18	15 business days	Accutest New England 50 D'Angelo Dr. 495 Technology Center W. Marlborough, MA 01752 Matt Morrell (508)481-6200	NA
Soil/sludge	PAHs & Alkylated PAHs	NA	Modified SW-846 Method 8270D	See Worksheet #18	15 business days	Accutest New England 50 D'Angelo Dr. 495 Technology Center W. Marlborough, MA 01752 Matt Morrell (508)481-6200	NA
Soil/sludge	Hexavalent Chromium	NA	SW846 3060A/NJDEP 7196A	See Worksheet #18	15 business days	Accutest New England 50 D'Angelo Dr. 495 Technology Center W. Marlborough, MA 01752 Matt Morrell (508)481-6200	NA

Formatted: Highlight
Formatted: Highlight

Matrix	Analytical Group	Concentration Level	Analytical SOP	Sample Location/ID Numbers	Data Package Turnaround Time	Laboratory/Organization (Name and Address, Contact Person and Telephone Number)	Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number
Soil/sludge	Percent Solids	NA	SM 2540B Mod	See Worksheet #18	15 business days	Accutest New England 50 D'Angelo Dr. 495 Technology Center W. Marlborough, MA 01752 Matt Morrell (508)481-6200	NA

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #31
Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)	Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)	Person(s) Responsible for Identifying and Implementing Corrective Actions (Title and Organizational Affiliation)	Person(s) Responsible for Monitoring Effectiveness of Corrective Actions (Title and Organizational Affiliation)
DESA Laboratory, EPA Region 2							
PT	Semiannually	External	NELAC	PT provider	Lab Personnel	Lab Personnel	Lab QA Officer
NELAC	Every two years	External	NELAC	Florida DOH	Lab QA Officer	Lab Personnel	Florida DOH
INTERNAL AUDIT	Monthly	Internally	DESA Lab	Lab QA Officer	Lab Personnel	Lab Personnel	Lab QA Officer
Accutest New England Laboratory							

NA = Not Available

Comment [DK4]: Need info

Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #32
Assessment Findings and Corrective Action Responses

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (Name, Title, Organization)	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response (Name, Title, Org.)	Timeframe for Response
Project Readiness Review	Checklist or logbook entry	Donna Getty, Task Leader, SERAS	Immediately to within 24 hours of review	Checklist or logbook entry	Donna Getty, Task Leader, SERAS	Immediately to within 24 hours of review
Field Observations/ Deviations from Work Plan	Logbook	Donna Getty, Task Leader, SERAS	Immediately to within 24 hours of deviation	Logbook	Donna Getty, Task Leader, SERAS	Immediately to within 24 hours of deviation
DESA Laboratory, EPA Region 2						
Proficiency Testing (PT)	Letter with PT failure indicated	Lab QA Officer	30 days after the audit	Investigate the reason for the PT failure	Lab QA Officer	45 days after the CA report
NELAC	Audit Report with Non-conformance to QAPP, SOPs, NELAC+LQMP	Lab Management	30 days after the audit	Investigate and have a corrective action plan for the deficiencies	Florida DOH	30 days after receiving notification
INTERNAL	Audit Report with Non-conformance to QAPP, SOPs, NELAC Regulations	Lab Management	30 days after the audit	Investigate and have a corrective action plan for the deficiencies	Lab QA Officer	45 days after the CA report
Accutest New England Laboratory						

Comment [djg5]: Need info

Formatted: Highlight

Formatted: Highlight

QAPP Worksheet #33
QA Management Reports Table

Type of Report	Frequency (daily, weekly monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)	Report Recipient(s) (Title and Organizational Affiliation)
Technical Report	Monthly	20th of the Month following each performance period	SERAS TL	ERT Project Officer & WAM
QA Report	Quarterly	February, May, August and November	SERAS QA/QC Officer	ERT Project Officer & Quality Coordinator

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #34
Verification (Step I) Process Table

Verification Input	Description	Internal/ External	Responsible for Verification (Name, Organization)
Chain-of-custody record	Original chain-of-custody records will be reviewed for correctness and completeness prior to submittal of samples to the laboratory.	Internal	Sandra Richards/ SERAS Environmental Technician
Laboratory analytical data package	Data packages will be reviewed/verified by the laboratory performing the work for completeness and technical accuracy prior to submittal.	External	DESA/ Accutest
Laboratory analytical data package	Reviewed for measurement performance criteria	External/Internal	DESA Independent Peer Reviewer/SERAS QA/QC Chemist [Cr(VI)]/Accutest Laboratory Personnel
Analytical Report	Deliverable will be reviewed to verify that transcription errors are not present.	Internal	QA/QC Chemist, QA/QC Officer, Program Manager
Analytical data package/ Final Report	The procedures for data review : 1- Data reduction/review by Primary Analyst. 2- Review complete data package (raw data) by independent Peer Reviewer 3- The Sample Project Coordinator reviews the project documentation for completeness followed by a QA review by the QAO 4- Final review by Branch Chief/Section Chief prior to release, this review is to ensure completeness and general compliance with the objectives of the project. This final review typically does not include a review of raw data. Details can be found in Laboratory Quality Management Plan.	Internal	Primary Analyst, Peer Reviewer, Sample Project Coordinator, Quality Assurance Officer, Section Chief/ Branch Chief. DESA LAB
Completeness Check	Review of planning documents, analytical data packages, sampling documents and external reports, as applicable, using the UFP-QAPP Checklist.	Internal	Donna Getty/ SERAS QA/QC Chemist/ SERAS

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #35

Validation (Steps IIa and IIb) Process Table

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	SOPs	Ensure that the sampling methods/procedures outlined in QAPP were followed, and that any deviations were noted/approved.	Donna Getty, SERAS Task Leader; Sandra Richards, SERAS Environmental Technician; Eric Daly, EPA OSC Gary Newhart, ERT WAM
IIb	SOPs	Determine potential impacts from noted/approved deviations, in regard to PQOs.	DESA Data Validation Personnel, EPA Region 2, ERT WAM
IIa	Chains of custody	Examine COC forms against QAPP and laboratory contract requirements (e.g., analytical methods, sample identification, etc.).	EPA Region 2 DESA Laboratory; Accutest Laboratory; Donna Getty, SERAS TL
IIa	Laboratory data package	Examine packages against QAPP and laboratory contract requirements, and against COC forms (e.g., holding times, sample handling, analytical methods, sample identification, data qualifiers, QC samples, etc.).	EPA Region 2 DESA Laboratory; SERAS QA/QC Chemist; Accutest Laboratory;
IIb	Laboratory data package	Determine potential impacts from noted/approved deviations, in regard to PQOs. Examples include PQLs and QC sample limits (precision/accuracy).	DESA Laboratory Peer Review Personnel; SERAS QA/QC Chemist
IIb	Field duplicates	Compare results of field duplicate (or replicate) analyses with RPD criteria	Gary Newhart, ERT WAM; Jon Gabry, Hazardous Waste Branch Chief; Eric Daly, OSC

Formatted: Highlight
Formatted: Highlight

QAPP Worksheet #36
Validation (Steps IIa and IIb) Summary Table

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIa	Soil/Sludge	VOCs, SVOCs, Metals/ Hg/Ti	Low	EPA Region 2 SOP #G-26, *Guidance for Laboratory Data Review, Rev. 1.2, 6/15/2012*	EPA Region 2, DESA Independent Peer Reviewer
IIb	Soil/Sludge	Hexavalent Chromium	Low	SERAS SOP #1017, *Data Validation Procedures for Routine Inorganic Analysis*	SERAS QA/QC Chemist

Formatted: Highlight
Formatted: Highlight

☑ Worksheet Not Applicable (State Reason) Usability will be assessed by the ERT and EPA Region 2

QAPP Worksheet #37
Usability Assessment

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used: NA
Describe the evaluative procedures used to assess overall measurement error associated with the project: NA.
Identify the personnel responsible for performing the usability assessment: EPA Region 2, ERT WAM
Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies: NA

Formatted: Highlight
Formatted: Highlight